

I urge the Commission to strongly reconsider its proposal to drop the Morse code testing requirement for the Amateur Radio Service for a number of very important reasons. I support dropping the requirement for the Technician and General Class but strongly urge the Commission to retain testing for the highest level, Amateur Extra Class licensees.

Emergency Communications:

One of the roles of the amateur service is to provide emergency communications in the event of a national disaster. Many different modes might be utilized, depending on the circumstances. If the emergency is localized, then FM repeater communications are likely to play the leading role. For more widespread emergencies, HF communications are important. If the emergency leaves computer systems operational, and if propagation is fairly good, then digital modes might be most effective. If computers are unavailable but we can rely on high power transmitters and fair propagation, then SSB might be the mode of choice. If we lose our computers and have to operate with limited power (for example from backup batteries or solar power) or under poor propagation conditions, then CW might be the best (and only) way to get through. Hurricanes Katrina and Rita proved this; CW nets passing health and welfare traffic into and out of devastated areas of the Gulf States were magnificent. For those who operate on DXpeditions or in contests, CW satisfies the key requirement for a high QSO rate. CW also makes better use of limited amateur spectrum than most other modes. For those with a limited budget or power or antenna restrictions, CW provides better intelligibility under poor signal conditions than any other common HF mode. For those who construct their own equipment, CW allows simpler and less expensive transceiver projects. For operation from remote places using battery or other alternative power, CW is the most power-efficient mode. And under certain emergency conditions, CW may be the only mode possible. For these reasons, and others, CW is a useful, indeed crucially important, mode of communications

Bandwidth Efficiency:

One of the areas where CW is clearly superior to most other modes is bandwidth efficiency. CW can achieve a similar QSO rate to phone while accepting a channel spacing of 250 Hz or less, compared with the 2 500 Hz minimum required by phone. This means that the QSO rate per Hertz of bandwidth occupied is at least ten times greater for CW than it is for phone. The only other mode that can compete with this remarkable efficiency is PSK-31. Bandwidth efficiency is especially important in the amateur service given the limited amateur allocations.

Poor Signal Conditions Readability:

When it comes to weak-signal performance, CW is a clear leader on the HF bands. Listening tests

have shown that SSB operator-to-operator grade service with 90% intelligibility of related words by trained operators requires a signal to noise ratio of 48 dB-Hz for a bandwidth of 3 KHz [3]. A similar level of intelligibility can be obtained with a CW signal to noise ratio of 27 dB-Hz in a 500 Hz bandwidth, while RTTY requires a signal to noise ratio of 55 dB-Hz. This means that for the same level of intelligibility, a phone signal requires 11 dB more power than a CW signal; and an RTTY signal requires 28 dB more power. For CW signals in a 250 Hz bandwidth the advantage over SSB is about 13 dB. In other words, to achieve the same intelligibility under poor conditions as a 100 W CW signal you would require a 2 KW SSB signal!

When band conditions are poor and SSB operators running high power into large beams complain that conditions are “impossible”, many still successfully have CW QSOs with 100 W or less and a dipole.

The relative power efficiency of CW is of particular benefit to operators who use simple low-powered stations, which is likely to be the case for operators from previously disadvantaged communities.

Low Power Requirements:

CW transceivers also often have significantly lower power drain than multi-mode designs. This makes CW transceivers ideal for battery-powered “adventure radio” operations, for example for operations from mountain summits. Commonly used portable SSB transceivers like the Yaesu FT-817 draw as much as 450 mA, making them much less suited to sustained battery-powered operation.

The Morse Requirement:

So what does it take to have basic operating ability in CW? Clearly the ability to send and receive Morse code. Someone with no Morse code ability cannot be considered basically competent in CW, just as someone who did not know the phonetic alphabet could not be considered basically competent in any of the phone modes.

The key abilities required for a basic level of competence in CW are the ability to send Morse code by hand, and the ability to receive it by ear. And this is why it is imperative to retain a Morse code requirement for the Amateur Extra License.

If the testing requirement is dropped, there will be a reduction in the number of new amateur operators who become proficient in CW. There will still be some who still learn Morse code, but they will be fewer than at present. The older operators who are already proficient in CW will eventually die or leave the hobby, resulting in a smaller proportion of CW operators on the bands.

The use of CW may stabilize at a lower number than at present, or it may lose critical mass and eventually die out altogether. After all, in order to become proficient in CW usually requires some sort of encouragement, so if there are not sufficient CW operators around there won't be anyone to train those newcomers who would like to learn. And many new amateurs who would have enjoyed CW and

become skilful operators if introduced to Morse code during their training will lose the opportunity to discover it for themselves.

Some new operators who would have spent much of their time operating CW in a 250 Hz bandwidth will instead operate SSB with a 2.5 KHz bandwidth. They will find that 100 W just does not cut it under poor conditions, and purchase linear amplifiers. The reduced number of CW operators may result in some or all of the current CW allocations being reallocated to phone; but this will not reduce congestion. On the contrary, even with additional allocations the bands will be more congested due to the higher proportion of 2.5 KHz bandwidth signals.

The resulting perception that expensive linear amplifiers and antenna systems are required to communicate effectively when conditions are poor is likely to be a much more serious barrier to entry amongst previously disadvantaged communities than any Morse test. After all, people from these communities are generally willing to invest their time to acquire new skills, while significant financial investments are simply not possible.

Eventually many amateurs will lose the ability to maintain a high QSO rate, or to rag-chew, while making best use of our scarce spectrum resources. QRP and adventure radio operations will become less popular, due to the difficulty of being heard on QRP phone and the dearth of CW activity. We won't have any good alternative to offer newcomers who can't afford linear amplifiers and large antenna arrays – we'll just have to tell them to wait until propagation gets better, or for the next upturn in the solar cycle. Government will target us as a "rich man's hobby". And should a disaster not conveniently leave our computers unscathed, we may not be able to perform the emergency communications role we so proudly proclaim.

This paints a bleak picture of the future of amateur radio.

Doing away with the Morse code requirement may result in the decline or even the eventual demise of an important mode that offers many advantages for today's amateurs. It would compromise our ability to provide emergency communications. Doing away with Morse means accepting the need for higher power and more complex and expensive antenna systems in order to communicate effectively under poor propagation conditions which will reduce the appeal of amateur radio in previously disadvantaged communities.

I therefore recommend that the Federal Communications Commission retain the Morse code requirement for the issuing of Amateur Extra licenses. Those who achieve the highest level of amateur radio excellence should be well versed and practiced in both the technical and operational characteristics of the radio art. Those who achieve this high level should be proficient in Morse to be considered well rounded "experts" in the amateur radio service.